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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/453,509	12/03/1999	ANTHONY BEVERINA	8594-001-64	2741

7590 10/24/2002

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EXAMINER
BRODA, SAMUEL

ART UNIT	PAPER NUMBER
2123	19

DATE MAILED: 10/24/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/453,509	Applicant(s) BEVERINA ET AL.	
	Examiner Samuel Broda	Art Unit 2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 July 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 November 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 7 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. This communication is in response to Applicants' Amendment received on 15 July 2002. Claim 1 was amended; claims 1-12 are pending.

Claim Objections

2. The following is a quotation of 37 CFR § 1.75(a) and (d)(1):

> (a) The specification must conclude with a claim particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention or discovery.
>
> . . .
>
> (d)(1) The claim or claims must conform to the invention as set forth in the remainder of the specification and the terms and phrases used in the claims must find clear support or antecedent basis in the description so that the meaning of the terms in the claims may be ascertainable by reference to the description.

2.1 Claims 1-12 are objected to because of inconsistent use of the terms "accessibility" and "accessability" appearing in the claims. For the purposes of claim examination, these terms were considered synonymous. Correction is required.

2.2 Claims 7-12 are objected to because of use of the term "which is mostly likely the threat" appearing in independent claim 7. For the purposes of claim examination, this term was considered equivalent to "which is a most likely threat." Correction is required.

Claim Rejections - 35 U.S.C. § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3.1 Claims 1-2, 4, 7-8, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over:

(a) Anonymous, "SAVI: Systematic Analysis of Vulnerability to Intrusion", Volume 1, SAND89-0926, Sandia National Laboratories, December 1989 (publication available from www.ntis.gov), in view of:

(b) Veatch et al, "An Airport Vulnerability Assessment Methodology", IEEE 33rd Annual 1999 International Carnahan Conference on Security Technology, pp. 134-151 (October 1999).

3.2 Regarding claims 1 and 7, Anonymous teaches the "Systematic Analysis of Vulnerability to Intrusion" ("SAVI") software that operates on PCs running DOS. The SAVI software permits a user to model the following characteristics: (1) target; (2) threat; (3) facility; and (4) protection systems, in order to calculate a set of probability of interruption estimates corresponding to "the probability that the response force will interrupt the adversaries prior to completion of their mission." See Anonymous, pages A-1 through A-4. A personal computer running SAVI would include a memory, input device, and processor.

Anonymous further teaches that the calculation of the probability of non-detection (corresponding to a likelihood of a successful delivery or a probability that a terrorist

successfully reaches the target) can be made using the SAVI software based on the worst-case estimates for the individual elements in the model. See pages A-20 through A-21.

The SAVI software models threat vectors corresponding to terrorists possessing equipment and explosives, and attacking while: (1) on foot; (2) in a land vehicle; and (3) in an aircraft or helicopter. See page A-19. For each site model, the SAVI software ranks and lists the most vulnerable path scenarios. See page A-26. Corresponding to the limitations appearing in Applicants' claims 1 and 7, the SAVI software determines an accessibility of a site by determining a threat vector which is a most likely threat vector by which the weapon will be delivered to the delivery point and the likelihood of a successful delivery based on the model. The SAVI software also provides suggestions for reducing path vulnerability when the software determines that no critical detection point exists on the path and that the probability of interruption equals zero. See pages A-26 through A-29.

However, the SAVI software does not appear to explicitly determine the probability that a terrorist attack will occur, and does not appear to explicitly calculate a risk based at least partially on the accessibility and probability.

Veatch et al teaches an airport vulnerability assessment methodology that models a relative risk for each threat-target combination. See Veatch et al, page 135 Section "The Methodology", columns 1-2. According to Veatch et al:

> . . . The methodology is applied in a logical, sequenced fashion that considers the threat, target identification, adversary types, malevolent acts of concern, and consequences of an adversary success. Algorithms are used to analyze potential consequences, the relative

> importance of targets to the adversary, and security vulnerability levels, to arrive at a relative risk for each threat and target combination. Countermeasures are then developed to minimize the risk and the methodology is reapplied to determine the relative risk reduction achieved.

Abstract, page 134.

Specifically, Veatch et al teaches the modeling of a real risk as the product of a target importance ("TI") that includes a consequence value, and a product of two probabilities "(1-LA) (1-LS)" corresponding to the probability that a terrorist attack will occur. See page 137 columns 1-2. Therefore, Veatch et al teaches the calculation of a risk based on at least partially on the accessibility and probability that a terrorist act will occur.

According to Veatch et al, the probability (l-LS) "is the likelihood that an adversary will be successful, given an attempt has been made." Page 137 column 2 paragraph 1. This probability corresponds to one minus the probability of interruption as calculated by the SAVI software.

3.3 Regarding claims 1 and 7, it would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to incorporate the path vulnerability analysis of the SAVI software into the relative risk calculations taught by Veatch et al, because the resulting combination would provide more accurate risk calculations and aid in the development of countermeasures to reduce the risk of terrorist attack.

3.4 Regarding claims 2 and 8, Veatch et al teaches calculation of risks using consequence calculations. See pages 136-137.

3.5 Regarding claims 4 and 10, Veatch et al teaches preparation of reports indicating probability, accessibility, and relative risk. See pages 144 and 147.

3.6 Claims 3 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anonymous, in view of Veatch et al, and further in view of Swiatek et al, "SAIC Science and Technology Trends II: Crisis Prediction Disaster Management", pp. 1-13 (June 1999)(paper available at:

http://www.saic.com/products/simulation/cats/VUPQPV4R.pdf)

(prior art previously supplied to Applicants).

3.7 Regarding claims 3 and 9, the combination of Anonymous and Veatch et al teaches calculation of risks using consequence calculations. However, the combination of Anonymous and Veatch et al does not appear to explicitly teach the calculating consequences using a consequence calculator plug-in.

Swiatek et al teaches the "Consequences Assessment Tool Set" ("CATS") software that operates on Pentium PCs running Windows and incorporates a "suite of hazard, casualty, and damage estimation modules to estimate and analyze effects due to natural phenomena, such as hurricanes and earthquakes, and technological disasters, such as terrorist incidents, involving weapons of mass destruction, and industrial accidents." Abstract, page 1 paragraph 1.

The CATS system also includes a "Technological Hazards" software portion that simulates effects due to nuclear, biological, and chemical weapons releases and includes risk calculations based on accessibility and probability. See page 7 column 1 "Technological

Hazards". This software portion is separated into plug-in modules; according to Swiatek et al at page 7 column 1:

> . . .While various codes exist that can perform the calculations, the main difficulty with existing NBC hazard products is the lack of a common architecture for the creation of input and output files and the ability to perform analysis for results of multiple models within a common frame of reference. CATS has solved these problems through the formation of a graphic user interface (GUI) that directly links to the NBC modules utilized, enabling ease of use and analysis in a common geographical information system.

3.8 Regarding claims 3 and 9, it would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to incorporate the plug-in features of the NBC models used in the CATS software into the combination of the SAVI software and the assessment methodology of Veatch et al, because the resulting software would permit easier analysis using multiple consequence models.

3.9 Claims 5 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anonymous, in view of Veatch et al, and further in view of:

(a) Baker et al, "Access Features - Bomb Blast", March 1998 (web page available at: http://www.ncsa.uiuc.edu/News/Access/Stories/BombBlast/indexBB.html (the "Intro Web Page"), and

(b) Baker et al, "Visualization of Damaged Structures", March 1998 (web page available at:

http://archive.ncsa.uiuc.edu/Vis/Publications/damage.html (the "Publication"))

(prior art previously supplied to Applicants).

Regarding claims 5 and 11, the combination of Anonymous and Veatch et al does not appear to explicitly teach the display of a three dimensional representation of the most likely threat vector. Baker et al teaches the visualization of structures damaged by terrorist bomb blasts. Intro Web Page at 1.

According to Baker et al, Publication at page 3, "the researchers were particularly interested in seeing the progress of the blast's shock front as it hit and went over the top of the building." Because bomb damage can be asymmetric, the researchers also used the three dimensional aspects of the simulation to position the observation point at various views and examine the propagation of the shock front and the subsequent building response.

3.10 Regarding claims 5 and 11, it would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to incorporate the three dimensional blast viewing features of the system of Baker et al with the features of the SAVI software system, and the assessment methodology of Veatch et al, because such a system would permit the user to better visualize the potential consequences of threat vectors corresponding to explosives placed in buildings.

3.11 Claims 6 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anonymous, and Veatch et al, and further in view of Castillo et al, "Modeling Probabilistic Networks of Discrete and Continuous Variables", Journal of Multivariate Analysis, Vol. 64 Issue 1, pp. 48-65 (January 1998).

Regarding claims 6 and 12, the combination of Anonymous and Veatch et al does not appear to explicitly teach the use of risk calculations using Bayesian networks. Castillo et al teaches the use of Bayesian networks to model networks of discrete and continuous variables.

According to Castillo et al, use of Bayesian networks with a set of conditional distributions is preferable to specifying a joint probability distribution when the number of nodes is large. See page 49 paragraph 2. Castillo et al illustrates use of a Bayesian network to model the damage assessment of reinforced concrete structures. See pages 50-57. Use of a Bayesian network permits estimation of the uncertainty propagating through the network (see pages 59-62) and permits sensitivity analysis through parameter modification (see pages 63-64).

3.12 Regarding claims 6 and 12, it would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to incorporate the Bayesian network modelling techniques of Castillo et al with the features of the SAVI software system, and the assessment methodology of Veatch et al, because such a system would permit uncertainty propagation estimation and sensitivity analysis.

Applicants' Arguments

4. Applicants argue in the Amendment at pages 2-4 that the rejections made under Section 103 are inapplicable to the amended claims because in the reference Swiatek et al the user chooses the release point and "Swiatek does not teach any determination of a vector by which the weapon will be delivered to that release point." (Amendment, page 2.)

Additionally, Applicants argue that the reference Swiatek et al teaches consequence calculations but does not determine accessibility, as required by claim 1.

Examiner's Reply

5. In response to Applicants' arguments, the Examiner has located references that better illustrate separate determinations of accessibility and consequence calculations. It should be noted that Applicants state in the Amendment on page 2 that "Claim 1 is the lone pending independent claim." That statement is incorrect, as claim 7 is written in independent form.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to Applicants' disclosure. Reference to Spencer, "Vulnerability Assessment", Corrections Today, Volume 60 Issue 4, pp. 88-92 (July 1998), is cited as teaching the application of vulnerability analysis tools such as SAVI to evaluate security objectives in correctional facilities.

7. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Samuel Broda, whose telephone number is (703) 305-1026. The Examiner can normally be reached on Mondays through Fridays from 8:00 AM – 4:30 PM.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Kevin Teska, can be reached at (703) 305-9704. The fax phone numbers for this group are:

(703) 746-7238 --- for communications after a Final Rejection has been made;

(703) 746-7239 --- for other official communications; and

(703) 746-7240 --- for non-official or draft communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the group receptionist, whose telephone number is (703) 305-3900.

SAMUEL BRODA, ESQ.
PATENT EXAMINER